

Impact Assessment of Ground Water Quality by Waste Water Outfall from a Fertilizer Factory

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ABSTRACT

The impact of a fertilizer factory of Bilaspur outfall effluent on the physiochemical properties of ground water of sirgitti Industrial area was investigated during the sampling period of three months. The outfall effluent discharge which affects the surface as well as ground water, sample of some ground water were collected. The physico-chemical parameters analyzed for all samples included temperature, pH, T.D.S., D.O., BOD, COD, NO₃, urea, T/NH₃, Cl⁻, SO₄²⁻ of the fertilizer factory of Bilaspur. Outfall effluents above IS and WHO standard reflect the poor effluent quality generated by fertilizer plant.

Keywords: Physico-chemical parameters, fertilizer, effluent.

INTRODUCTION

The impact of industrial toxic and hazardous waste on living organism can not be over stressed. Consequently upon the industrial revolution, many production and manufacturing companies have due to improper waste management techniques, added toxic and hazardous waste into aquatic environment. The presence of these wastes in the environment causes extensive damage to the quality characteristics and ecology of the environment.

The present investigation involves the analysis of ground water of Sirgitti industrial area Bilaspur (c.g.) India, where a fertilizer plant is located. Because of the outfall effluent of . fertilizer factory discharges into this area.

METHODOLOGY

Study area

Sirgitti is the industrial area which is located at Raipur road Bilaspur, Bilaspur

District forms parts of Bilaspur commissionerary in the Chattisgarh. The Bilaspur is situated at in the northern east part of Chattisgarh. It lies between Northern latitudes 21 40: 23 28 and east longitude 81 14:83 19. The average elevation from the sea level ranges from 750 to 3693 feet, Bilaspur district is bounded in the north by Surguja District, in the west by Mandla District, in the south by Raipur and the east by Raigarh.

Experiment

Water sample of ground water where collected near fertilizer plant included

outfall effluent fertilizer factory before mixed into ground water .Outfall effluent is coded as “A” and water sample coded as S-1, S-2 S-3 S-4,S-5. However Parameters were studied by Standard method (AAPHA.1995. AWWA 1989 .Goel 1986 Vogel 1978 WPCF).

The water quality parameters of effluents and water sample are analyzed , in this study temp, pH , DO , turbidity T.D.S. were analyzed by Elico-made water analyzer kit, conductivity by digital conductometer, (systronic model no 304). Urea and Phosphate by spectrophotometric method, chloride by Argenometric method.

Observed value of physico- chemical parameters of all samples with their I S & W H O standards

S/N	parameter	A	S-1	S-2	S-3	S-4	S-5	I S	WHO
1	Temperature (°C)	28	27.5	28.6	29	29.5	29.5	Not more than 40	—
2	pH	5.9	6.25	6.43	6.20	6.8	6.9	6.5-8.5	7.8-8.5
3	Conductivity dS/m	4.25	0.49	2.34	1.34	1.67	1.65	-	300
4	TDS	1121	270	375	365	245	343	2100	500
5	S S	199	58	65	66	78	67	100	
6	Total Hardness	501.5	320	285	256	199	256	300	200
7	D O	3.4	4.5	3.9	3.30	4.3	3.45	5.0	—
8	B O D	48	5.8	7.9	6.0	8.3	5.9	3.0	5.0
9	C O D	185	15.9	30.5	35.7	45	65	250	10
10	f/NH ₃	36.8	26.6	27.8	35.7	28.9	23.7	50	10
11	Cl ⁻	969.6	876.8	654.8	657.7	668.9	567.7	1000	200
12	SO ₄ ²⁻	667.8	245.7	354.5	344.61	376.8	435.6	400	100
13	PO ₄ ³⁻	2.45	1.2	0.98	0.56	0.56	0.87	-	0.01- 0.5

Note-All Value in mg/li except pH , temp and conductance.

RESULT AND DISCUSSION

Result of water quality parameter of the fertilizer factory outfall effluent and ground water of study area and I.S., WHO standard for outfall effluents of industry for comparison are shown in table-1. Apart from SS, sulphate and chloride the fertilizer factory outfall effluent recorded the highest concentration for all the water quality physico-chemical parameter measured with the exception temperature, DO, sulphate, chloride the concentration of all other parameters of the fertilizers factory outfall effluents are than I S and W H O standard. Ground water of study area also recorded higher concentration for all physico-chemical parameters.

CONCLUSION

It has been observed that liquid effluent from fertilizer factory being discharged into open area which mixes into ground water do have a very marginal impact on the ground water quality causing major variation in the Physical and chemical characteristics.

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